What is claimed is:

1. A routing loop detection program that controls a computer to be operated as equipment comprising:

a extracting portion that extracts the packets with a time-exceeded message from all packets captured by a packet capture device connected to a network;

a reading portion that reads destination IP addresses of the discarded packets from the time-exceeded messages of the packets extracted by said extracting portion;

a transmitting portion that transmits an investigating packets to the destination IP address read by said reading portion through a communication device connected to said network;

a receiving portion that receives a packet in response to the investigating packet transmitted by said transmitting portion through said communication device; and

an output portion that notifies occurrence of routing loop when the packet received by said receiving portion has a time-exceeded message.

2. The routing loop detection program according to claim 1, wherein said investigating packet may be a service request packet for a network application service on the application layer.

3. A routing loop detection program that controls a computer

to be operated as equipment comprising:

a counter that counts the number of packets whose IP header includes the hop number for each of all the possible hop numbers when a packet capture device connected to a network acquires all packets captured within a predetermined period;

a discriminator that discriminates whether a flat portion or a sawtooth portion exists in a histogram based on the number of packets for the respective hop numbers counted by said counter; and

an output portion that notifies a sign of occurrence of routing loop when said discriminator discriminated that the histogram has the flat portion or the sawtooth portion.

4. A routing loop detection method that is executed by a computer, comprising steps of:

extracting the packets with a time-exceeded message from all packets captured by a packet capture device connected to a network;

reading destination IP addresses of the discarded packets from the time-exceeded messages of the extracted packets;

transmitting an investigating packets to the destination IP address read at the reading step through a communication device connected to said network;

receiving a packet in response to the investigating packet transmitted through said communication device; and

notifying occurrence of routing loop when the packet received has a time-exceeded message.

5. A routing loop detection method that is executed by a computer, comprising steps of:

counting the number of packets whose IP header includes the hop number for each of all the possible hop numbers when a packet capture device connected to a network acquires all packets captured within a predetermined period;

discriminating whether a flat portion or a sawtooth portion exists in a histogram based on the number of packets for the respective hop numbers counted; and

notifying a sign of occurrence of routing loop when it is discriminated that the histogram has the flat portion or the sawtooth portion.

6. A routing loop detection device comprising:

a extracting portion that extracts the packets with a time-exceeded message from all packets captured by a packet capture device connected to a network;

a reading portion that reads destination IP addresses of the discarded packets from the time-exceeded messages of the packets extracted by said extracting portion;

a transmitting portion that transmits an investigating packets to the destination IP address read by said reading portion

through a communication device connected to said network;

a receiving portion that receives a packet in response to the investigating packet transmitted by said transmitting portion through said communication device; and

an output portion that notifies occurrence of routing loop when the packet received by said receiving portion has a time-exceeded message.

7. A routing loop detection device comprising:

a counter that counts the number of packets whose IP header includes the hop number for each of all the possible hop numbers when a packet capture device connected to a network acquires all packets captured within a predetermined period;

a discriminator that discriminates whether a flat portion or a sawtooth portion exists in a histogram based on the number of packets for the respective hop numbers counted by said counter; and

an output portion that notifies a sign of occurrence of routing loop when said discriminator discriminated that the histogram has the flat portion or the sawtooth portion.

8. A computer readable medium that stores a routing loop detection program that controls a computer to be operated as equipment including:

a extracting portion that extracts the packets with a

time-exceeded message from all packets captured by a packet capture device connected to a network;

a reading portion that reads destination IP addresses of the discarded packets from the time-exceeded messages of the packets extracted by said extracting portion;

a transmitting portion that transmits an investigating packets to the destination IP address read by said reading portion through a communication device connected to said network;

a receiving portion that receives a packet in response to the investigating packet transmitted by said transmitting portion through said communication device; and

an output portion that notifies occurrence of routing loop when the packet received by said receiving portion has a time-exceeded message.

9. A computer readable medium that stores a routing loop detection program that controls a computer to be operated as equipment comprising:

a counter that counts the number of packets whose IP header includes the hop number for each of all the possible hop numbers when a packet capture device connected to a network acquires all packets captured within a predetermined period;

a discriminator that discriminates whether a flat portion or a sawtooth portion exists in a histogram based on the number of packets for the respective hop numbers counted by said counter;

and

an output portion that notifies a sign of occurrence of routing loop when said discriminator discriminated that the histogram has the flat portion or the sawtooth portion.

10. A routing loop detection method that is executed in a network including at least two routers and a packet capture device on every path connecting adjacent routers, comprising steps of:

for a first computer,

counting the number of packets whose IP header includes the hop number for each of all the possible hop numbers when said packet capture device acquires all packets captured within a predetermined period;

discriminating whether a flat portion or a sawtooth portion exists in a histogram based on the number of packets for the respective hop numbers counted;

notifying the IP address of the router corresponding to the packet capture device to a second computer when it is discriminated that the histogram has the flat portion or the sawtooth portion;

for a second computer that receives the notification,

extracting the packets with a time-exceeded message from all packets captured by the packet capture device located just behind a gateway router at the most upstream of the network, when a packet that flows from said gateway router to the outside

of the network;

reading destination IP addresses of the discarded packets from the time-exceeded messages of the extracted packets;

transmitting an investigating packets to the destination IP address read at the reading step through a communication device connected to said network;

receiving a packet in response to the investigating packet transmitted through said communication device;

discriminating whether the source IP address of the received packet is coincident with the IP address notified from said first computer when the received packet has a time-exceeded message;

notifying occurrence of routing loop when the source IP address of the received packet is coincident with the IP address notified from said first computer.